

## Kind of the stitch

### 1. Classification of stitch (stitch type) based on JIS L0120 <Table II -1>

| Class | Stitch type           | Number of subdivided classes |
|-------|-----------------------|------------------------------|
| 100   | Chainstitch           | 7                            |
| 200   | Hand stitch           | 13                           |
| 300   | Lockstitch            | 27                           |
| 400   | Double chainstitch    | 17                           |
| 500   | Over-edge chainstitch | 15                           |
| 600   | Covering chainstitch  | 9                            |

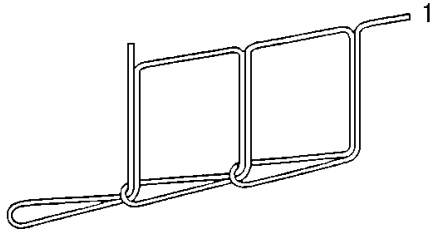
The stitch is sorted by 6 classes and each class is subdivided. Number of subdivided classes is 88 in total.

### 2. Stitch type and the feature

#### 1) Chainstitch

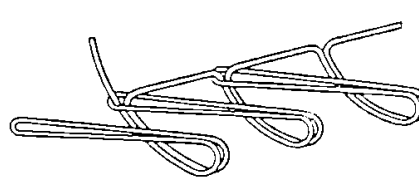
##### ① Example of stitch formation

JIS mark 101 ... Chainstitch



<Fig. II -1>

JIS mark 103 ... Blindstitch



<Fig. II -2>

##### ② Feature

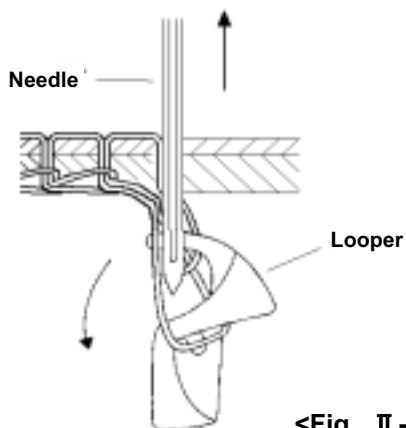
A piece of thread is interlaced like a chain under the cloth and the stitches are formed as knitted.

The constructive feature is that the stitches are untied one after another when the interlacement at the end of sewing comes off.

##### ③ Application

Basting (ML-111), button sewing (AMB-189N), (MB-377), chainstitch buttonholing (MBH-180S), blindstitch and closing of bag opening

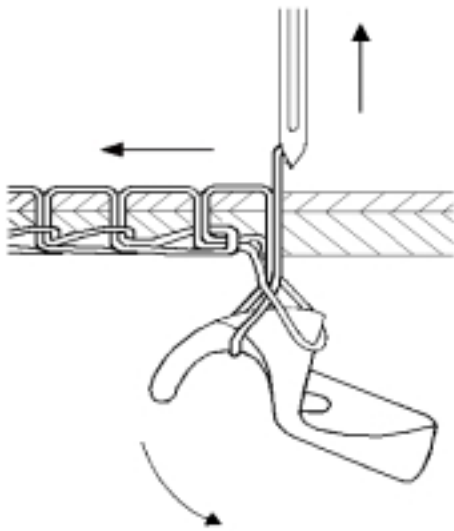
##### ④ Stitch formation



<Fig. II -3>

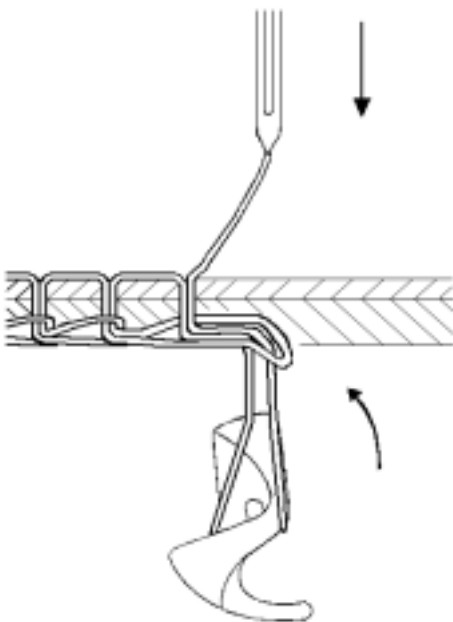
a : Needle thread slacks at the position where needle slightly goes up from its lowest position, and looper catches the needle thread which has become like a loop.

Also, the needle enters the circle of needle thread which is widened by the looper.



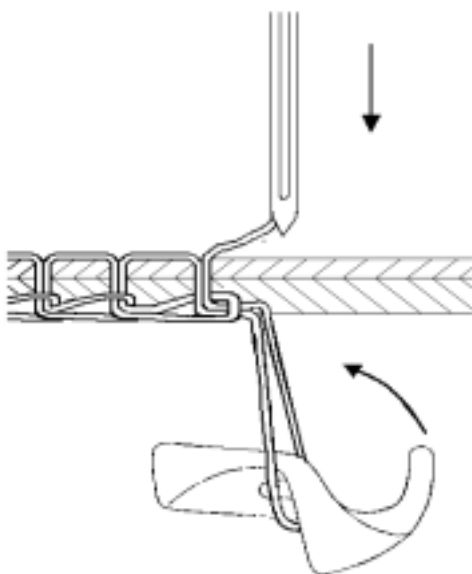
- b : Needle comes off the cloth and the cloth is fed.  
 Looper rotates and removes the thread which the looper caught before while pulling in the needle thread. Needle bar continues going up and needle thread take-up lever lifts the thread.

<Fig. II 4>



- c : Looper continues rotating and pulls in the thread in the center of the looper and thread take-up lever tightens the thread which the looper removed before.

<Fig. II -5>



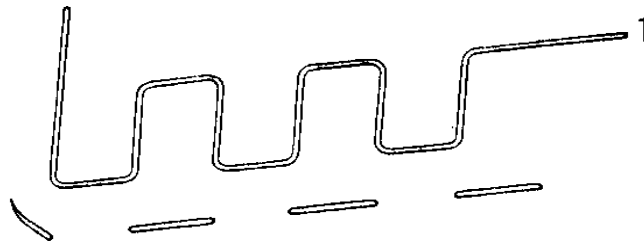
- d : Cloth feed is finished and a stitch is formed.  
 Needle penetrates the cloth to continue to next stitch, a : .

<Fig. II -6>

## 2) Hand stitch machine

### ① Example of stitch formation

JIS mark 209 ... Hand stitch



<Fig. II -7>

### ② Feature

Same stitch as that of hand stitch is formed by a piece of thread. Thread is drawn in every stitch or every other stitch and the length of stitching is limited. Since friction is given at the same position of the sewing thread many times, the thread is untwined during sewing resulting in thread breakage unless the thread is a high-durable one. Even when the sewing is made, the stitch looks broken.

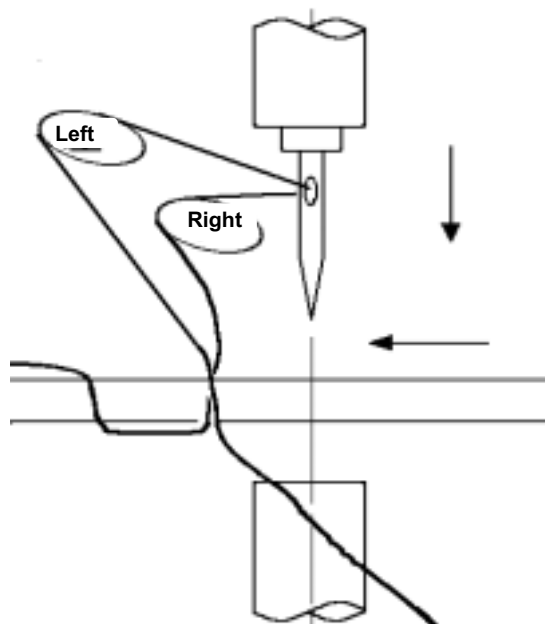
Therefore, the thread that can be used is limited.

### ③ Application

Decorative stitch of suits or the like (FLS-350N), kimono (Japanese national dress) (FLS-351N)

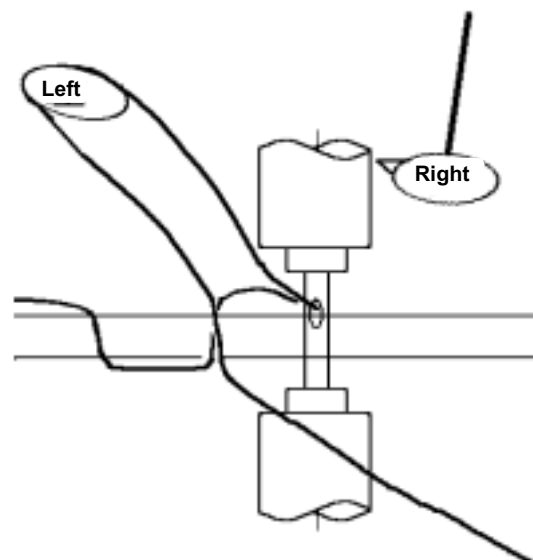
Button sewing of coats, suits, etc. (FBS-340N-1)

### ④ Stitch formation



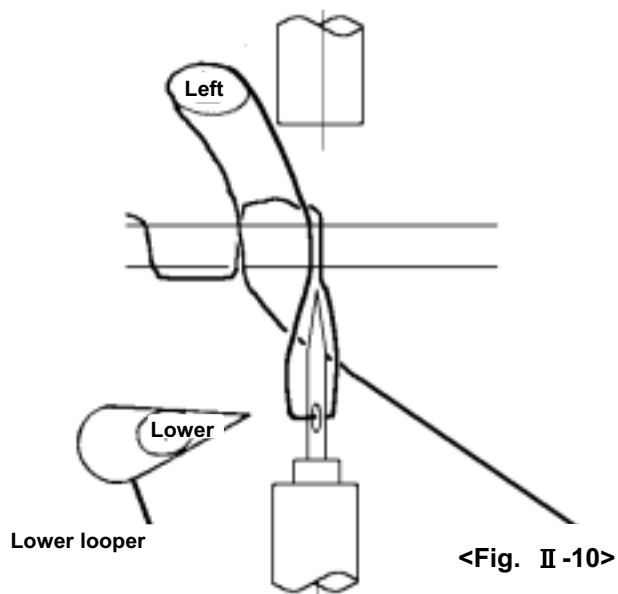
<Fig. II -8>

a : Needle is fixed to upper needle bar, and left-hand and right-hand loopers draw and retain the thread. Cloth is fed and the needle comes down.

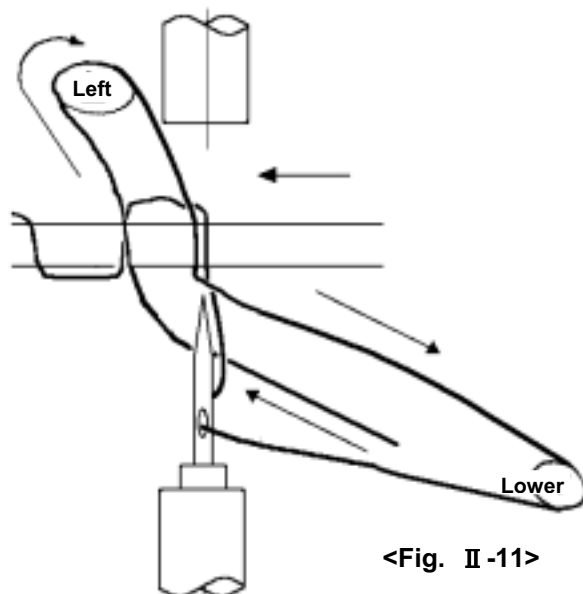


<Fig. II -9>

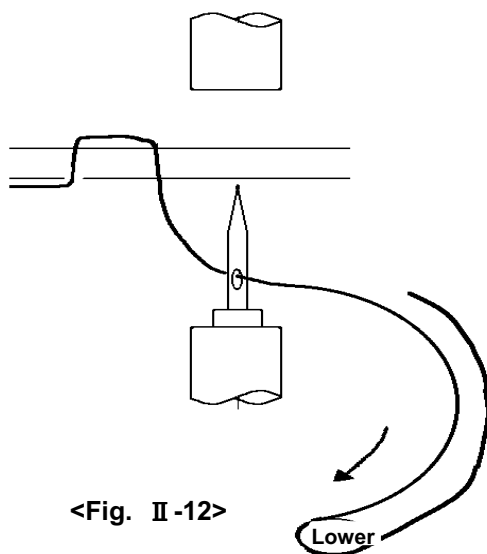
b : Needle penetrates the cloth and is delivered to the lower needle bar. The right-hand looper returns to its home place.



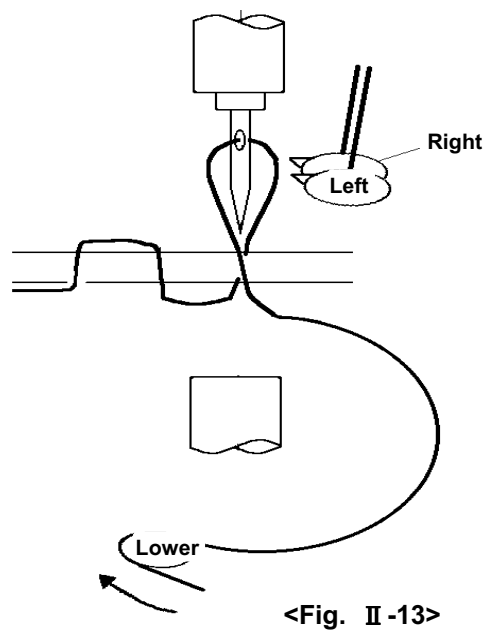
c : Lower looper catches the thread loop at the position where the lower needle bar slightly goes up from its lowest position.



d : Lower looper draws out thread which enters under the cloth one stitch before from the above left-hand looper. Simultaneously the cloth is fed.



e : Needle goes up and penetrates the cloth. Lower looper further pulls in the thread downward.

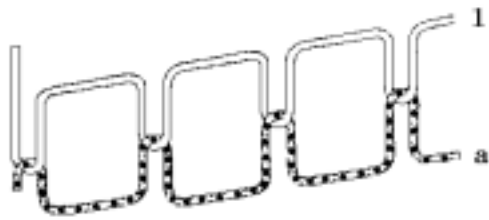


f : Needle penetrates the cloth, and is delivered to the upper needle bar and goes up. Thread is wiped out by the lower looper. Next, the above left-hand and right-hand loopers catch the thread to continue to a :

### 3) Lockstitch

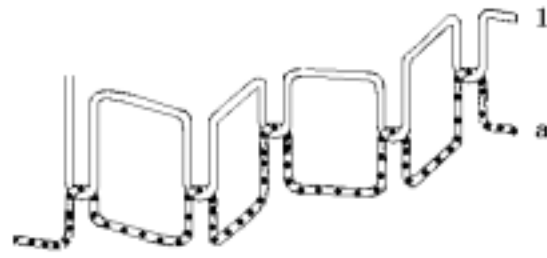
#### ① Example of stitch formation

JIS mark 301 ... 1-needle lockstitch



<Fig. II -14>

JIS mark 304 ... 1-needle lockstitch zigzag stitch



<Fig. II -15>

#### ② Feature

Two threads of upper thread (needle thread) and lower thread (bobbin thread) are used. Every stitch upper thread and lower thread interlace each other and the stitches on right and wrong sides are the same. This stitch is widely used since it is not easily frayed and securely joins plural pieces of cloth.

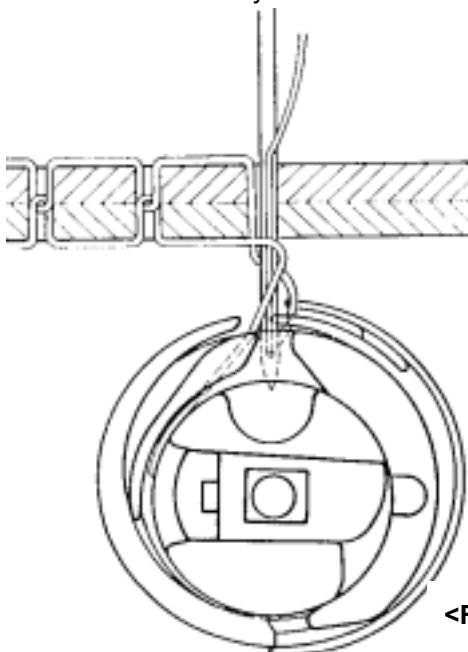
It is necessary to replace the bobbin thread since stitch formation is obtained by rotation of the needle thread around the bobbin case.

#### ③ Application

General sewing (DDL-5550N, DDL-5700-7, DLU-5490N-7, DLN-5410N-7), Shirring (DLU-5494N-7), 2-needle lockstitch (LH-3128-7), Zigzag stitch (LZ-2288N-7), Plain stitch, Decorative stitch, Bartacking (LK-1900), Lockstitch buttonholing (LBH-790RS-1), Button sewing (LK-1903/BR25), Pocket sewing (APW-196) and Pattern sewing (AMS-210D)

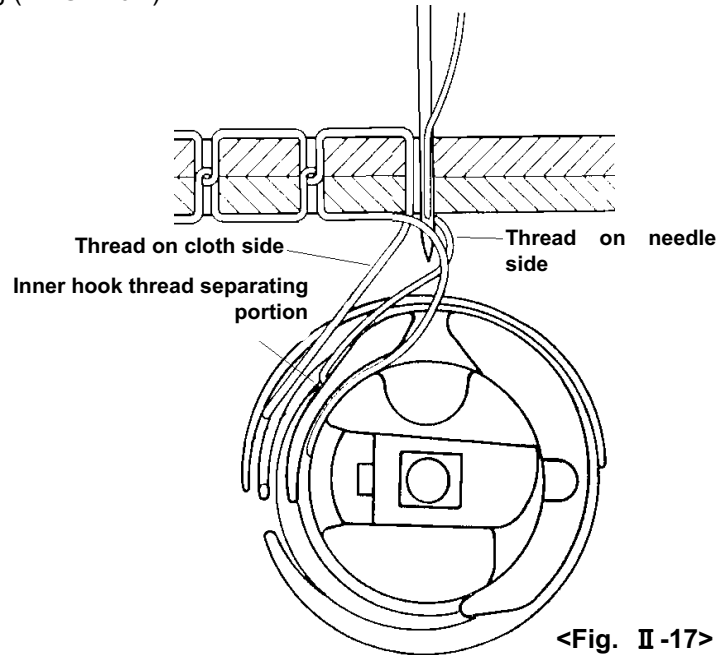
#### ④ Stitch formation

##### ④-1 Horizontal full-rotary hook



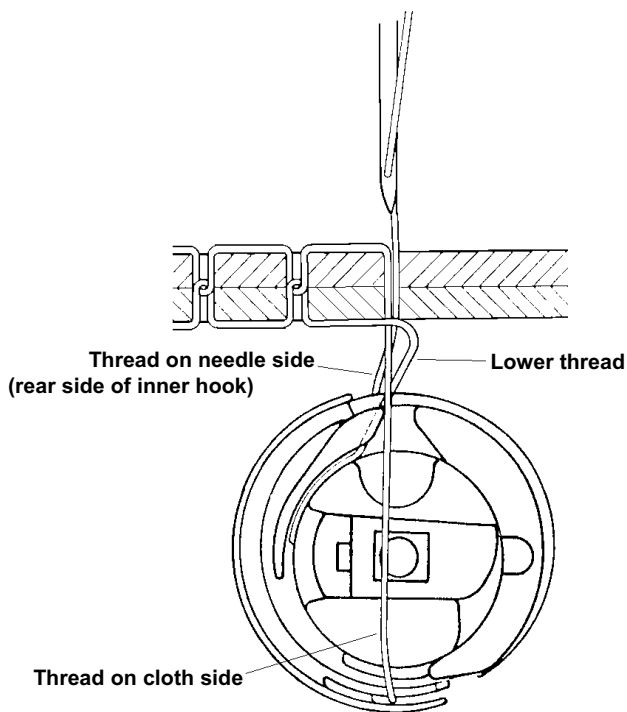
<Fig. II -16>

a : Upper thread slacks at the position where the needle slightly goes up from its lowest position, and blade point of outer hook catches the loop-shaped upper thread and pulls in the upper thread.

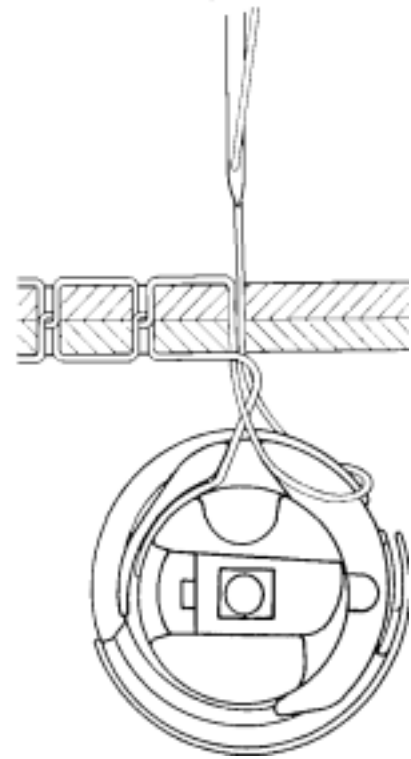


<Fig. II -17>

b : Upper thread which is pulled in by the blade point of outer hook is separated at the inner hook thread separating portion so that the upper thread on the needle side is separated to the rear side of inner hook and the upper thread on cloth side is separated to the right side of inner hook.



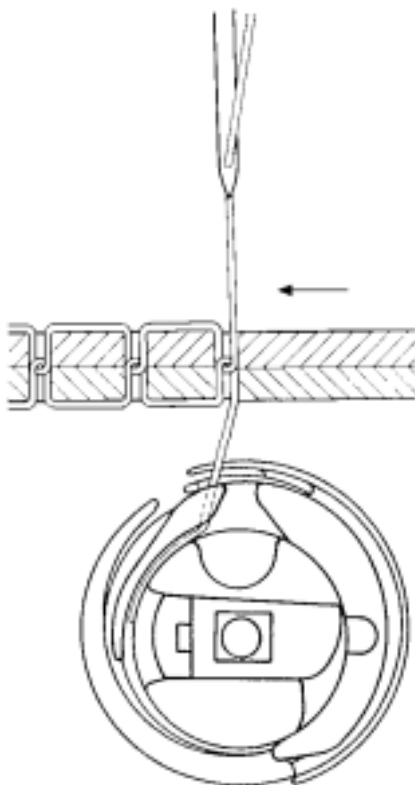
<Fig. II -18>



<Fig. II -19>

c : Outer hook rotates, while pulling in upper thread, around the periphery of bobbin case containing lower thread set in inner hook. Thread take-up lever supplies upper thread which is necessary to rotate around inner hook. (Suppose that inner hook is a human being, and it looks like doing rope-skipping.)

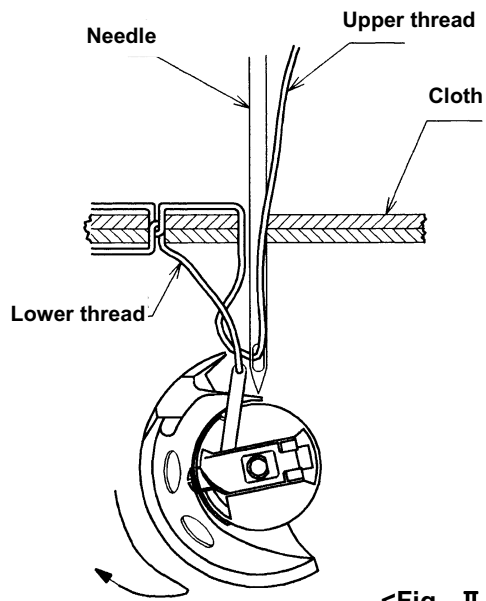
d : Immediately after upper thread has rotated around inner hook, thread take-up lever lifts upper thread and the upper thread is interlaced with the lower



e : Stitch is formed when the upper thread lifts the lower thread and cloth is fed at the end. Next, needle comes down and penetrates cloth to continue to a : .

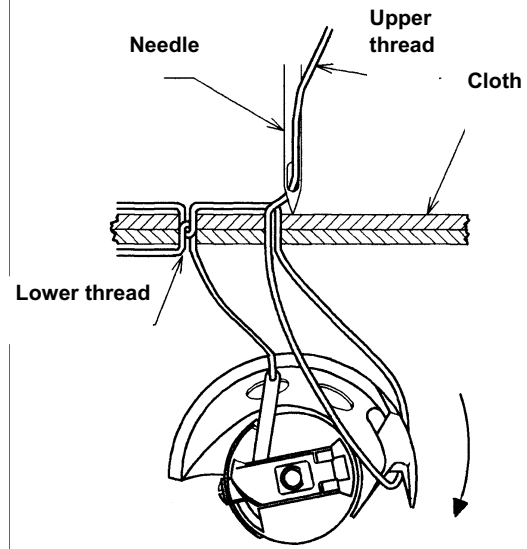
<Fig. II -20>

④-2 Semi-rotary hook



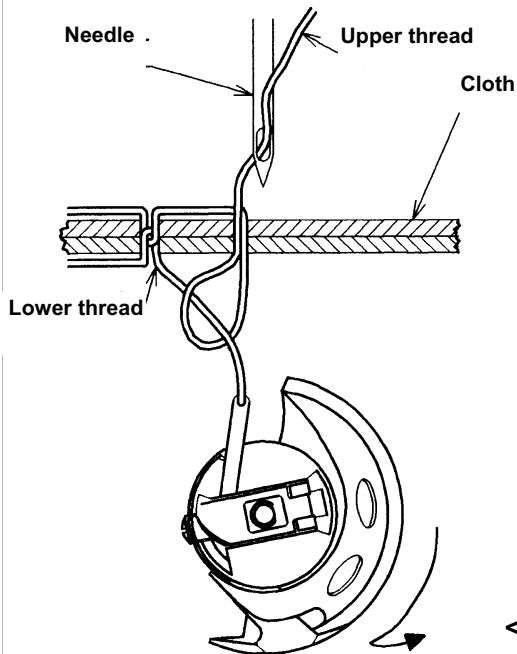
<Fig. II -21>

a : Blade point of semi-rotary hook catches loop-shaped upper thread.



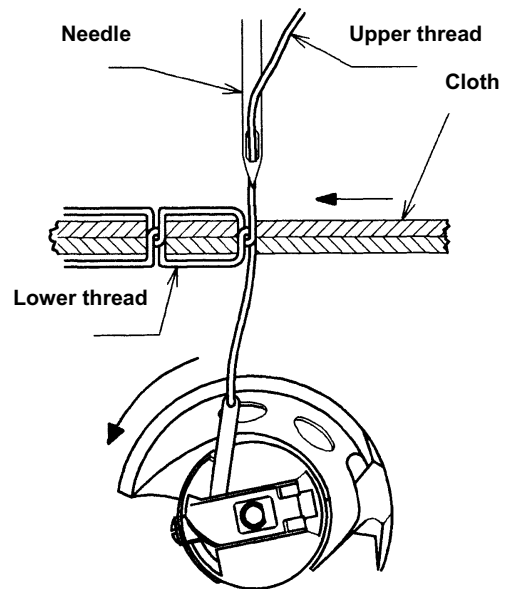
<Fig. II -22>

b : Upper thread rotates around the periphery of bobbin case by rotation of the hook.



<Fig. II -23>

c : After 1/2 rotation of the hook, upper thread is lifted by thread take-up lever and is interlaced with lower thread.



<Fig. II -24>

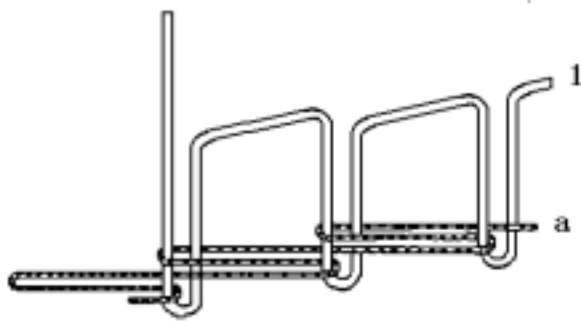
d : Stitch is formed when the upper thread lifts the lower thread and cloth is fed at the end. To be continued to a : .

#### 4) Double chainstitch

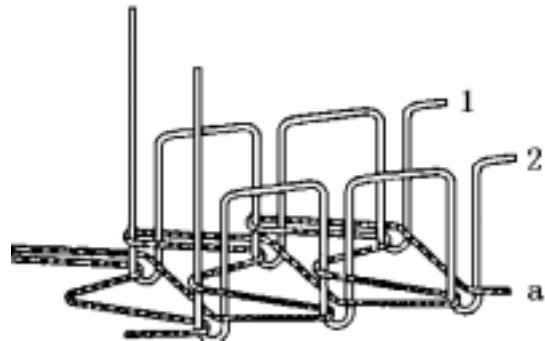
##### ① Example of stitch formation

JIS mark 401 ... 1-needle double chainstitch

JIS mark 406 ... 2-needle double chainstitch



<Fig. II -25>



<Fig. II -26>

##### ② Feature

Upper thread (needle thread) and lower thread (looper thread) are interlaced with each other like a chain under cloth, and the stitches look like knitted.

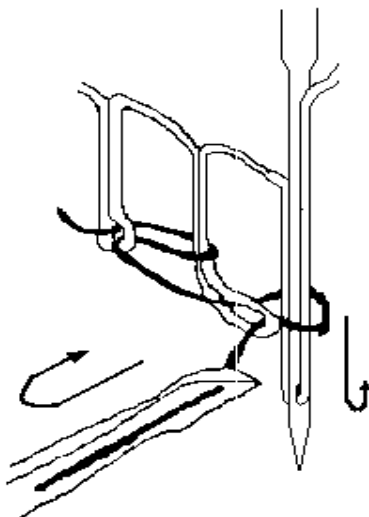
The stitches look the same as those of lockstitch when observing from the surface of cloth. Sewing can be performed continuously for a long time since lower thread as well as upper thread can be supplied continuously. Stitches are full of elasticity, and widely used for the elastic cloth and places to which shock is applied. Defect, when compared with the lockstitch, is that the stitch is easily frayed.

##### ③ Application

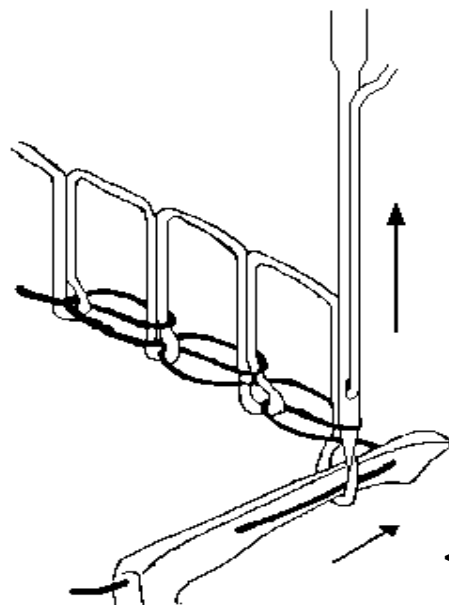
General sewing (MH-481-5) Rubber tape attaching, Lace attaching to underwear, swim-suit, etc.

Eyelet buttonholing (MEB-2688), Side seam (MS-1190), Belt loop making (MFB-2600)

##### ④ Stitch formation



<Fig. II -27>

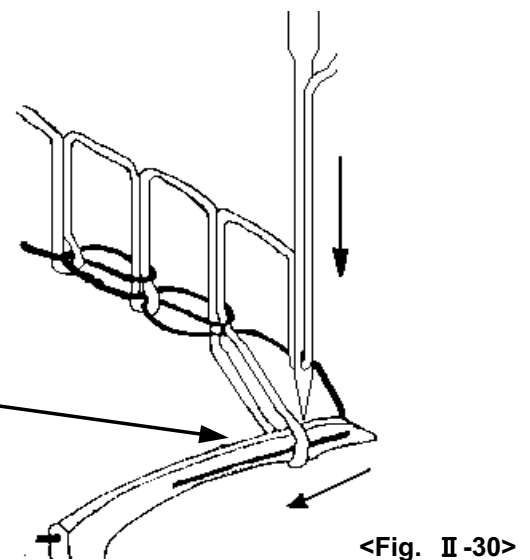
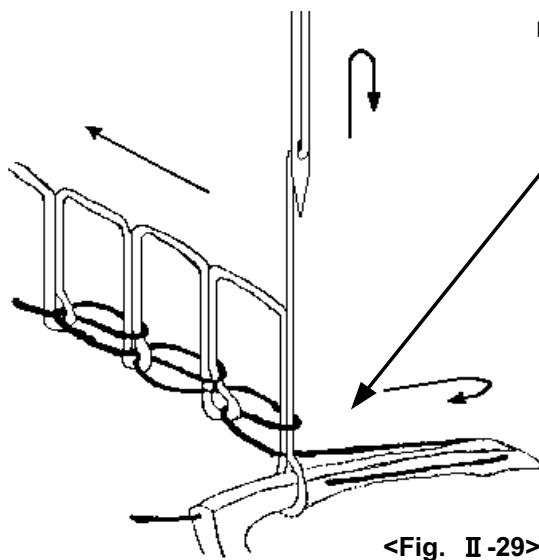


<Fig. II -28>

a : Needle thread comes off looper and is tightened. Then, looper scoops needle thread at the position where needle slightly goes up from its lowest position.

b : Needle continues to go up and looper thread comes off needle. Looper advances in the state that it has scooped needle thread.





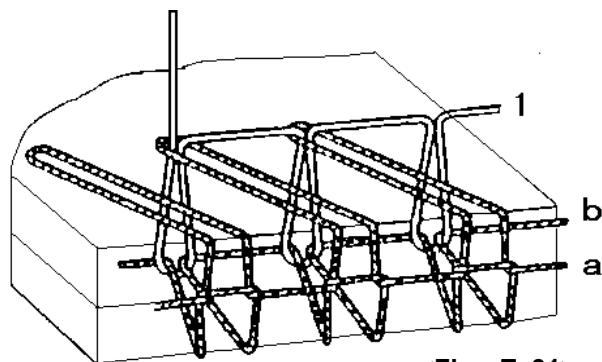
c : Cloth is fed when needle is in the highest dead point and looper is in the most advanced state, and the final tightening of needle thread is performed.

d : Needle comes down and the needle tip scoops looper thread. Looper performs elliptic motion. Then, stitch formation is continued to

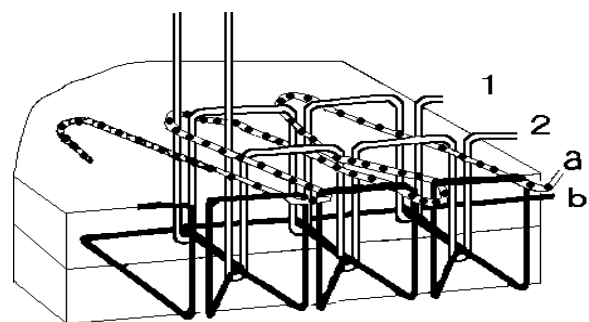
## 5) Over-edge chain stitch

### ① Example of stitch formation

JIS mark 504 ... 1-needle overlock



JIS mark 506 ... 2-needle overlock



### ② Feature

In many cases, three threads of upper thread (needle thread) and lower threads (upper looper thread and lower looper thread) are interlaced with one another so as to hem material end, and the stitches look like knitted.

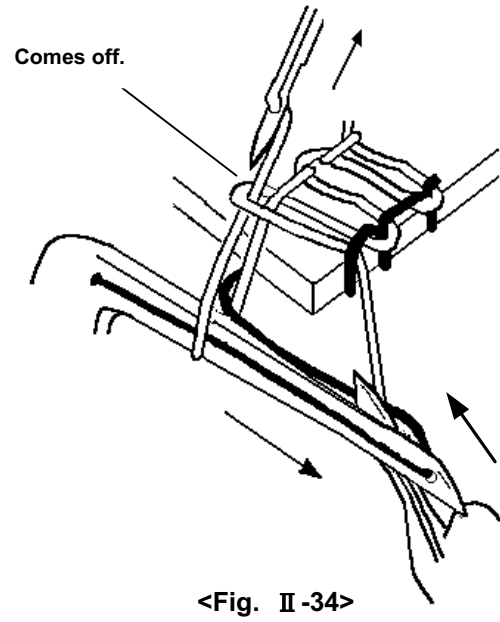
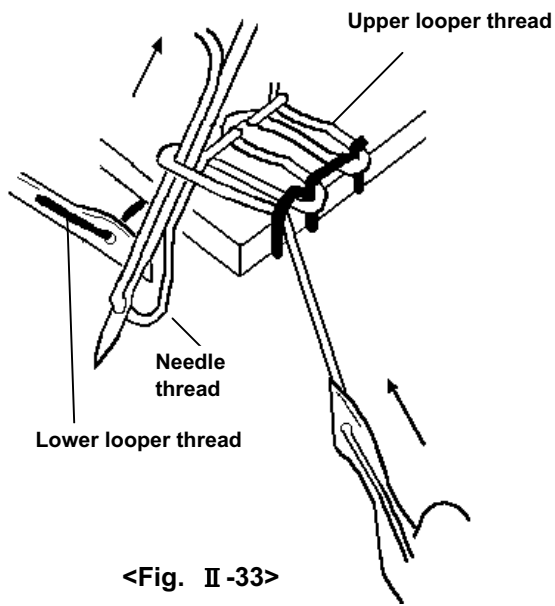
This stitch belongs to the classification of chainstitch. The stitch itself can expand following the expansion of cloth. Accordingly, this stitch is mostly used for the cloth which is largely expanded (knit or the like).

### ③ Application

Cloth which is largely expanded, blind over-edging, prevention of fray at material end (ASN-397/serging machine)

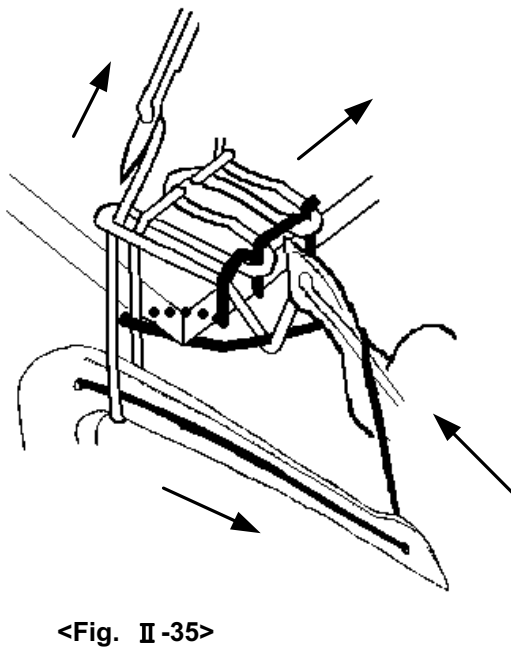
Overlock sewing machine (MO-3904), 2-needle overlock machine (MO-3914), Cylinder-bed overlock sewing machine (MOC-3914)

④ Stitch formation

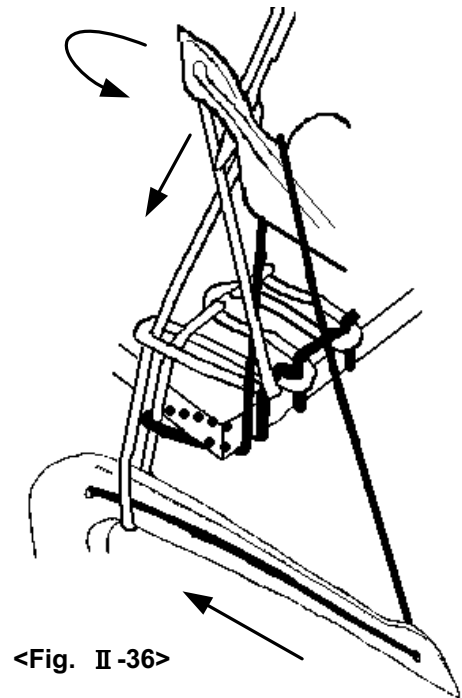


a : Lower looper scoops needle thread loop.

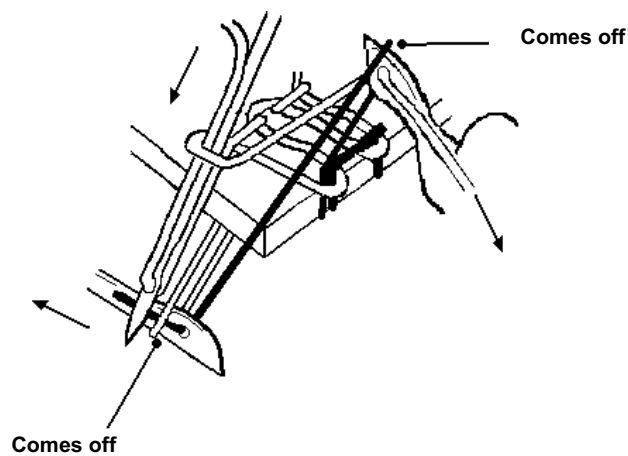
b : Upper looper thread comes off needle and upper looper scoops lower looper thread.



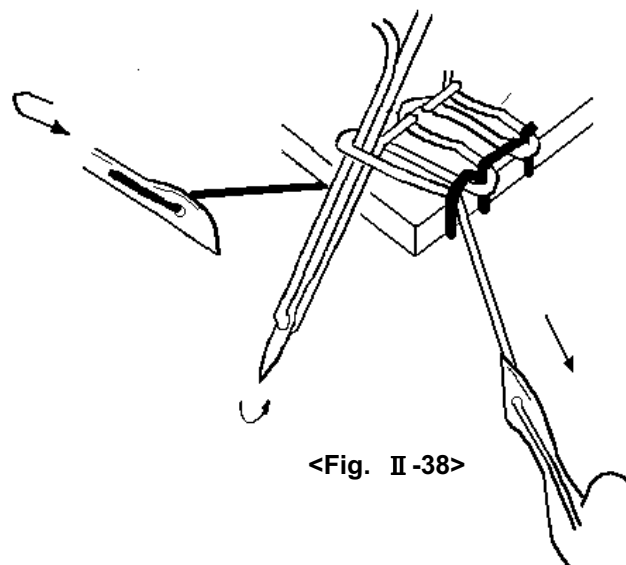
c : Cloth is fed.



d : Needle tip scoops upper looper thread.



<Fig. II -37>



<Fig. II -38>

e : Lower looper thread which is caught on upper looper comes off. Then, needle thread which is caught on lower looper comes off.

f : Needle thread which is before one stitch is tightened at the lower dead point of needle. Stitch formation is continued to a : .

#### 《Extra : Compound stitching》

##### Feature

This stitch is favourable to the productivity since double chainstitching and over-edge chainstitching are simultaneously performed (safety stitch).

The machine is called "Interlock machine". (MO-3916)

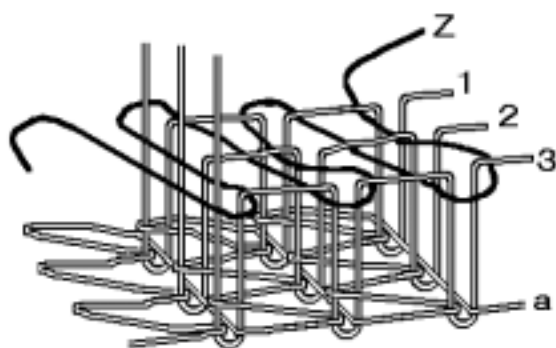
##### Application

General runstitching, side joining of shirts, slacks, etc.

#### 6) Covering chainstitch

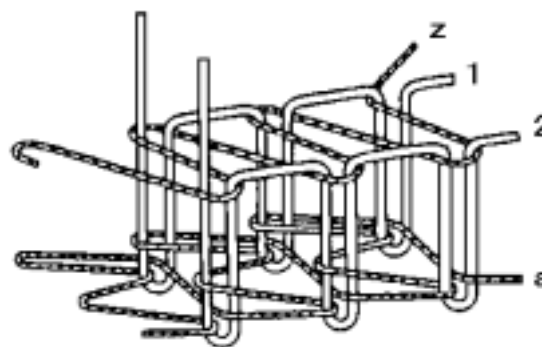
##### ① Example of stitch formation

JIS mark 605 ... 3-needle covering chainstitch



<Fig. II -39>

JIS mark 602 ... 2-needle covering chainstitch



<Fig. II -40>

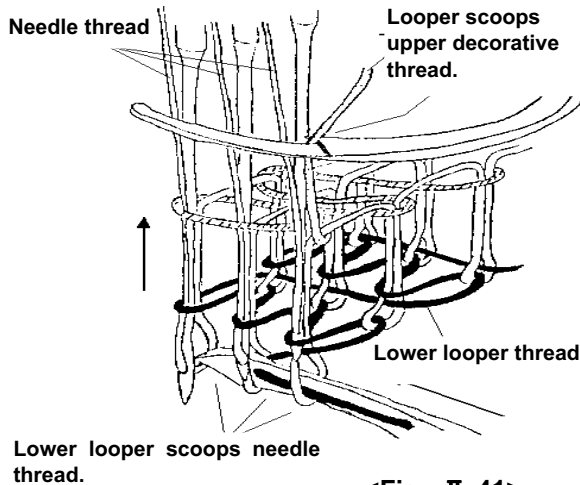
② Feature

There are two or more needle threads and decorative threads on both the right and wrong sides of cloth (generally, upper decorative thread is attached to 2-needle or 3-needle double chainstitch). The stitch is full of elasticity and looks nice.

③ Application

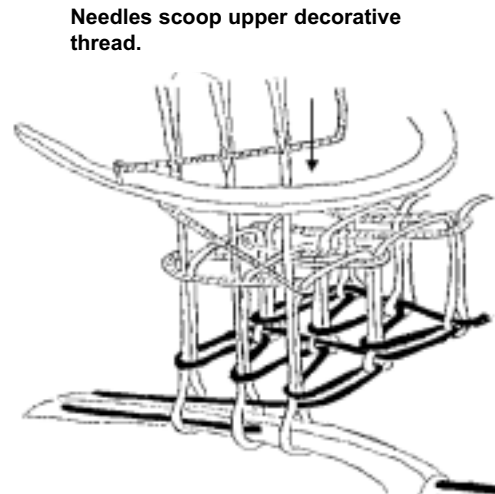
Hemming (MFC-7605/AH-1) Decorative stitch for lace attaching to underwear, swim-suits, etc.

④ Stitch formation



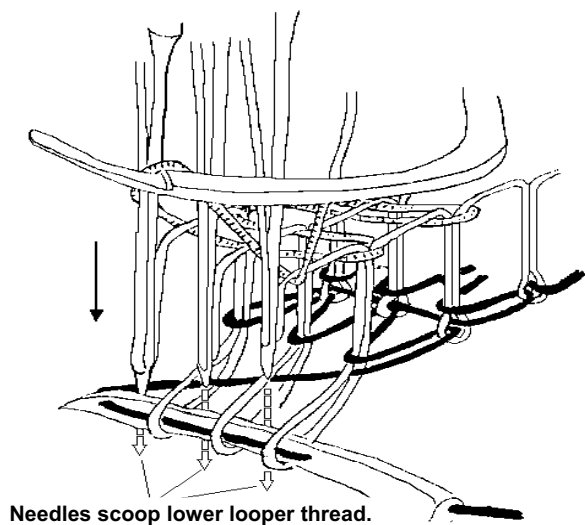
<Fig. II-41>

a : Lower looper scoops needle thread loop, and simultaneously upper decorative looper scoops upper decorative thread.



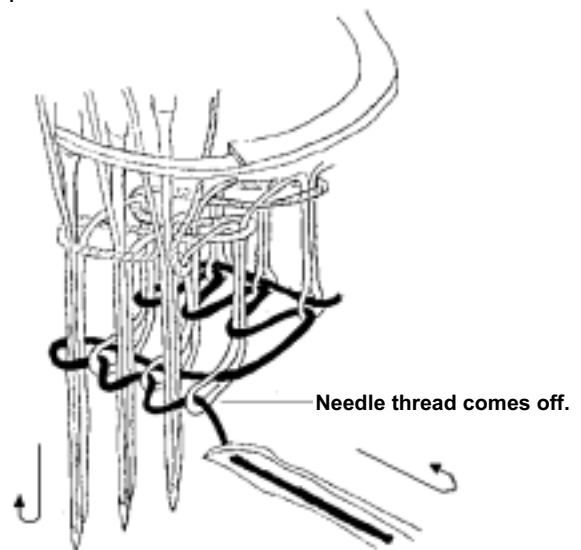
<Fig. II-42>

b : Cloth is fed and only right-hand needle is positioned in the outside of decorative thread. Two left-hand needles come down and scoop upper decorative thread.



<Fig. II-43>

c : Needles further come down and scoop lower looper thread. And, two right-hand needles enter in between the respective needle threads as shown in the illustration.



<Fig. II-44>

d : Needle thread comes off lower looper and needle comes down in its lowest position. Lower looper and upper decorative looper are in the most retracted positions. Stitch formation is continued to a : .